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REPORT

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INFORMATION FROM

FOREIGN DOCUMENTS OR RADIO BROADCASTS CD NO.

COUNTRY USSR

DATE OF
INFORMATION 1943SUBJECT Scientific - Background of ideological quarrel
BiographicHOW
PUBLISHED Bimonthly periodical

DATE DIST. 30 Nov 1950

WHERE
PUBLISHED - Kazan'

NO. OF PAGES 2

DATE
PUBLISHED Aug 1943

LANGUAGE Russian

SUPPLEMENT TO
REPORT

50X1-HUM

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SOURCE Uspekhi Khimii, Vol XII, No 4, 1943, pp 245-255.YA. K. SYRKIN

V. V. Lebedinskiy

[Ya. K. Syrkina was attacked at the 2 - 7 February 1950 meeting of the Scientific Council of the Institute of Organic Chemistry, Academy of Sciences USSR, as the chief proponent of the resonance theory of chemical structure in the USSR. According to resolutions passed at the meeting, the resonance theory is erroneous, bourgeois, and idealistic. Under the circumstances, a review of Syrkina's background and scientific activity may be of interest.]

Yakov Kivovich Syrkina, Corresponding Member of the Academy of Sciences USSR, was born on 5 December 1894, at Minsk. He is a professor and director of the Laboratory of Structure of Matter of the Physicochemical Institute imeni Karpov, and also professor and head of the Chair of Physical Chemistry of the Moscow Institute of Fine Chemicals Technology imeni M. V. Lomonosov. He received a Stalin Prize in 1943, based on the following works: "The Structure of Boron Hydrides," "The Structure of the Naphthalene Molecule," "Dielectric Constants of Polar Liquids and Dipole Moments," published in 1941-42, and a monograph, "The Chemical Bond and the Structure of Molecules," which was completed in 1942.

Syrkina is one of the outstanding USSR physical chemists. His work in the field of chemical kinetics comprises studies of the mechanism of chemical reactions and the number of collisions in solutions, investigation of the kinetics of slow reactions, and attempts at an explanation of Menshutkin's reactions of the formation and decomposition of quaternary ammonium salts by assuming transitional states. He has also investigated the effect of solvents on reaction kinetics, the influence of viscosity and the number of hydrogen bonds on the rate of ester saponification, and many other problems.

Syrkina has carried out extensive investigations in the field of structure and on the nature of the chemical bond. In connection with this work, he has measured the dipole moments of a great number of compounds of various types. The

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data obtained in the course of this work permitted conclusions in regard to the interaction of polar groups in molecules. The work in question led to the result that certain hydrocarbons having a double bond (fluorene, cyclopentadiene, and others) exhibit polarity and permitted a calculation of the share of the ionic state in bonds as well as a quantitative evaluation of the electronic nature of double and triple bonds.

In another series of investigations, Syrkin applied Raman spectroscopy and clarified by this method the structure of (1) certain oxonium compounds, (2) compounds containing the carboxyl group, and (3) substances containing an ethylenic double bond.

The last major subdivision of Syrkin's work consists in applications of quantum-mechanical calculations to the study of the problem of the chemical bond. In the course of these particular investigations, he dealt with the structure of a number of chemical compounds, among them naphthalene and boron hydrides. He explained the nature of boron hydride bonds without using the concept of the single electron bond. In the case of naphthalene, Syrkin clarified the difference in the reactivities of the alpha and beta positions.

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